Water Supply Update

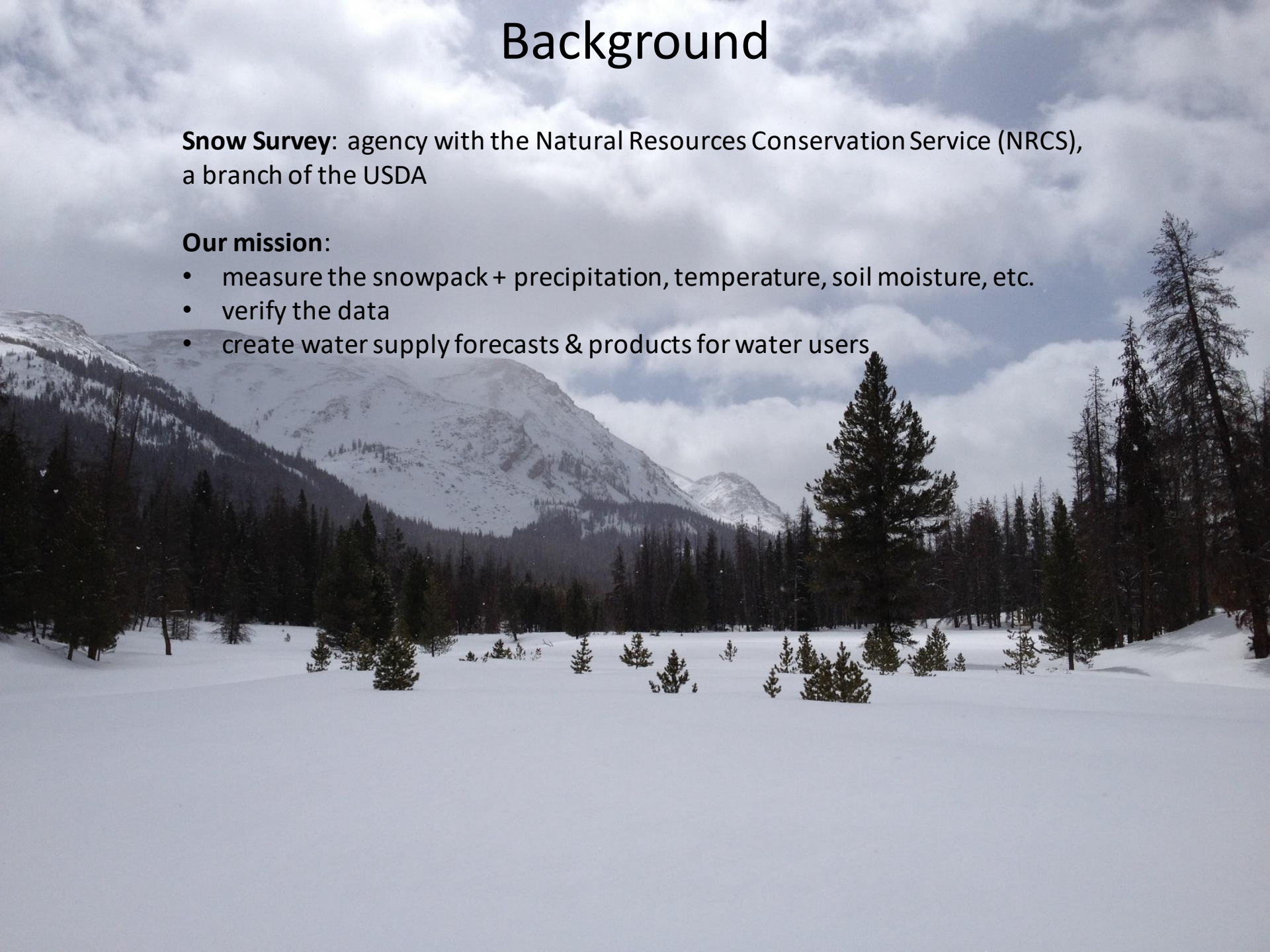
June 22nd, 2020

Jordan Clayton, USDA, NRCS Snow Survey

*My apologies that I could not present this material. We are rebuilding a SNOTEL site near Soldier Summit. Thank you to Laura Haskell for presenting these slides on our behalf!

Any questions? Please contact me: jordan.clayton@usda.gov (or) 385-290-9718

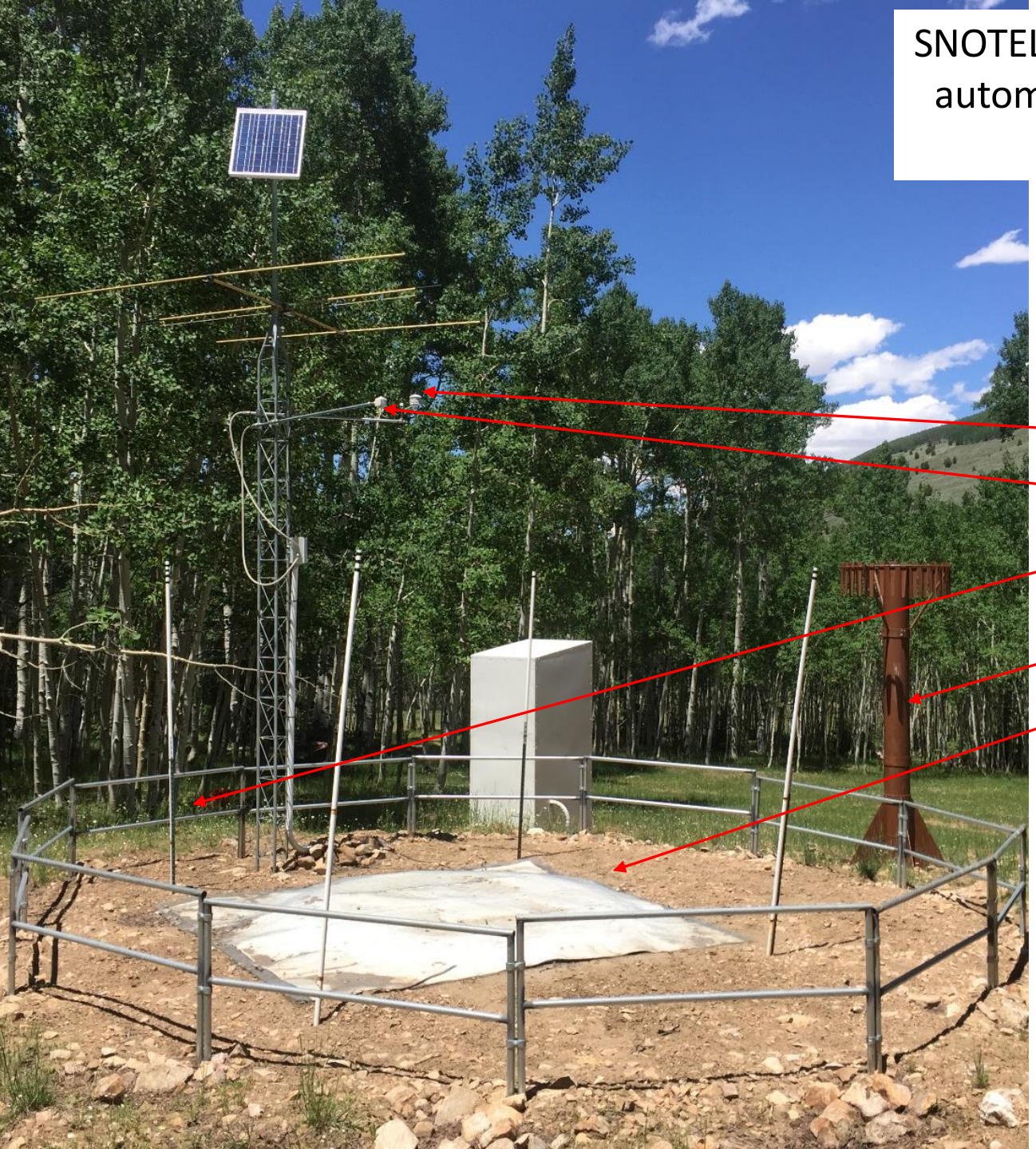
Background



Snow Survey: agency with the Natural Resources Conservation Service (NRCS), a branch of the USDA

Our mission:

- measure the snowpack + precipitation, temperature, soil moisture, etc.
- verify the data
- create water supply forecasts & products for water users

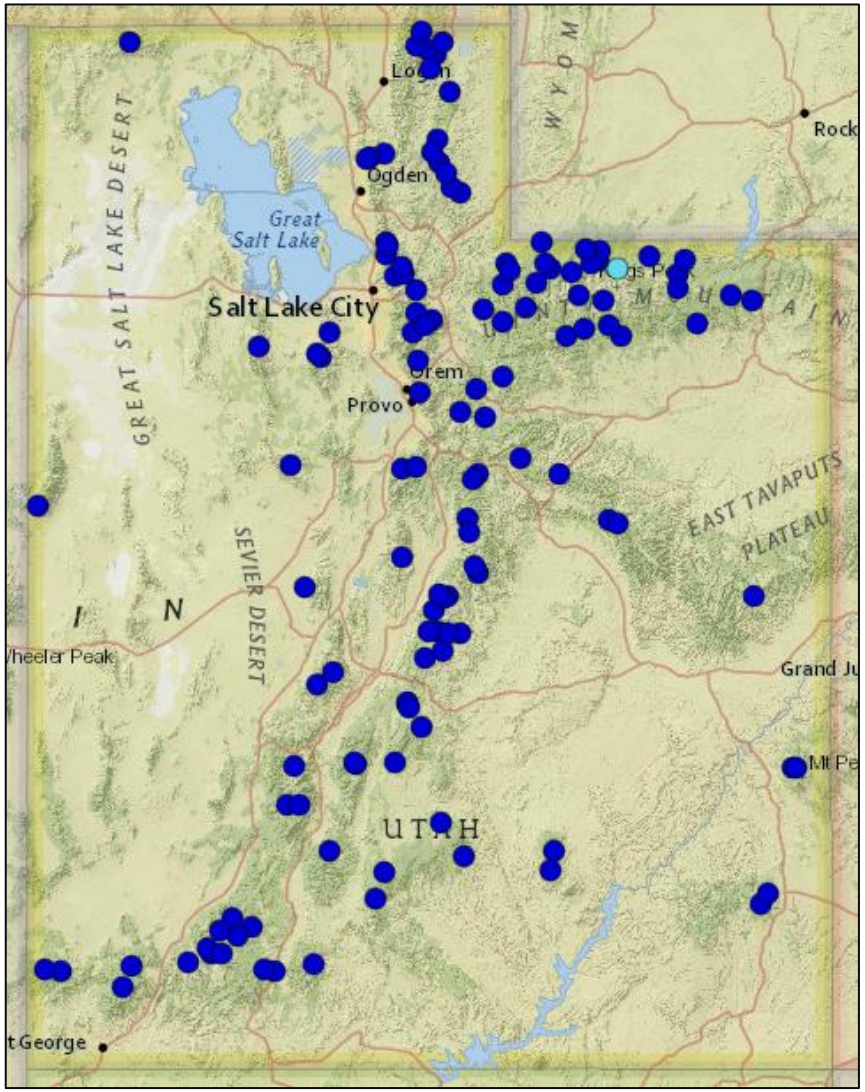


SNOTEL = "SNOwpack TELemetry" automated system that delivers hourly information

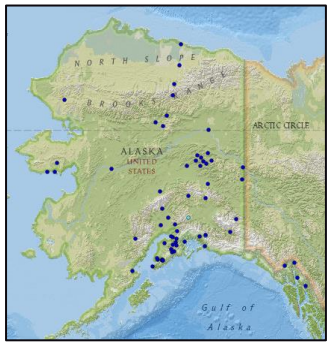
SNOTEL sensors

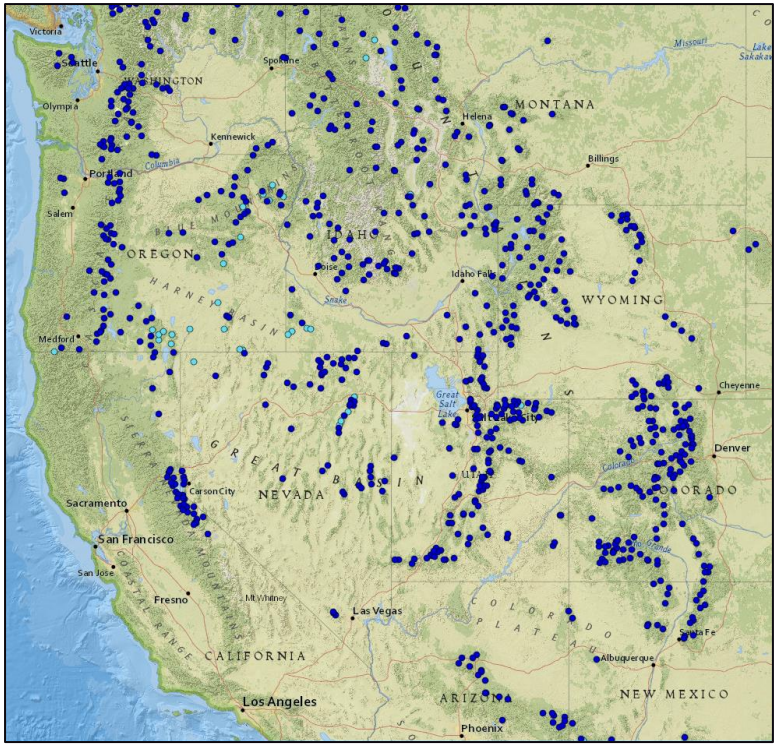
- Air temperature
- Snow depth
- Soil moisture & temperature
- Precipitation accumulation
- Snow water equivalent

SNOTEL system



135 SNOTEL sites in Utah

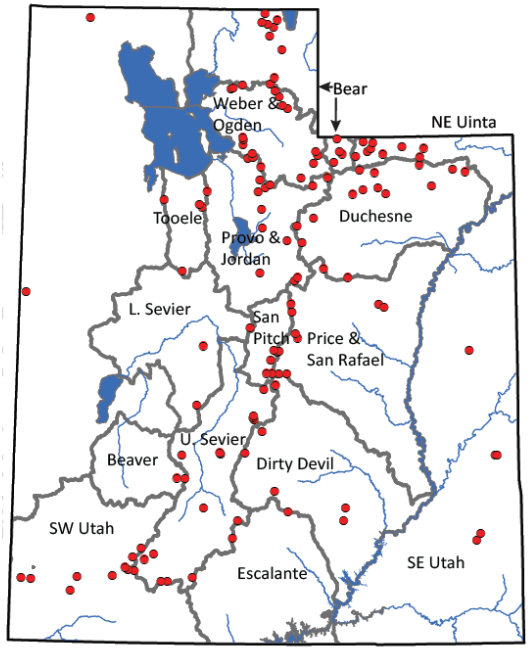




~900 SNOTEL sites in West

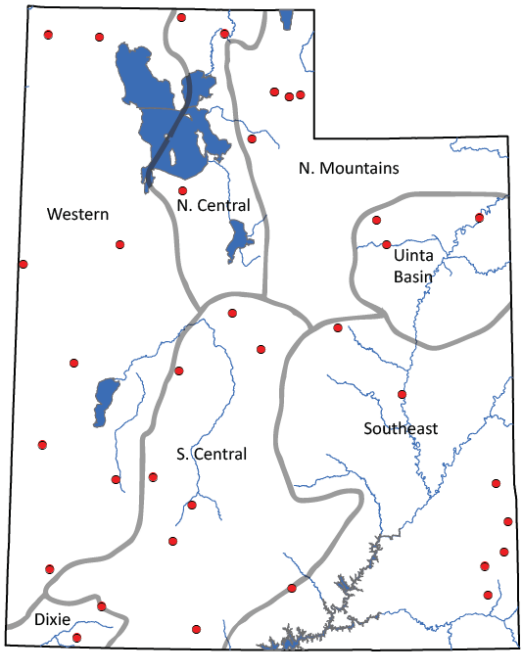
SNOTEL

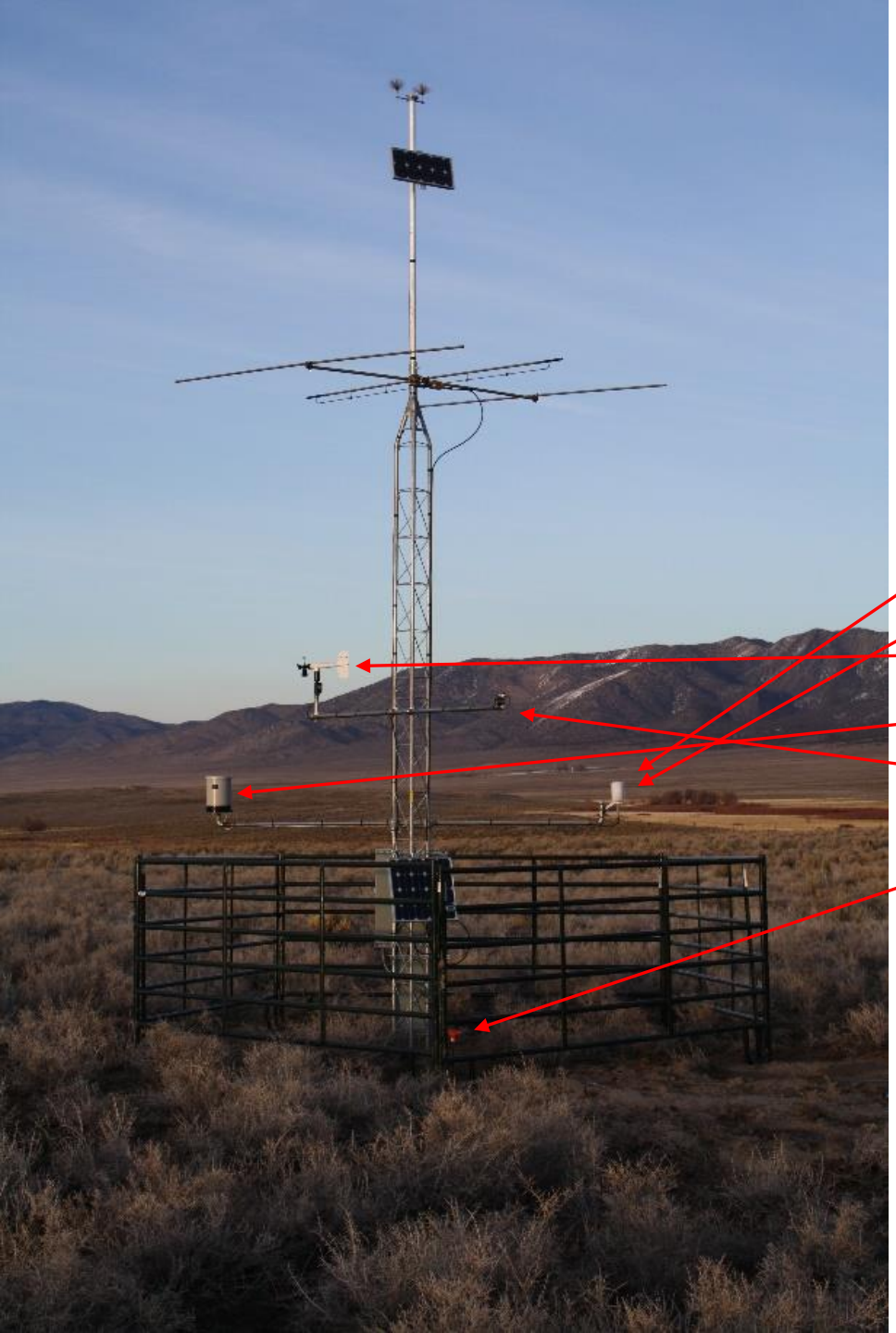
- Mountainous areas
- High elevation (>6,000 ft)
- Water supply forecasting
- Installed where snow pack represents the water supply



SCAN

- Agricultural and range lands
- Mid elevation (3 – 7,000 ft).
- Irrigation efficiency and rangeland productivity
- Installed on spatially representative soils



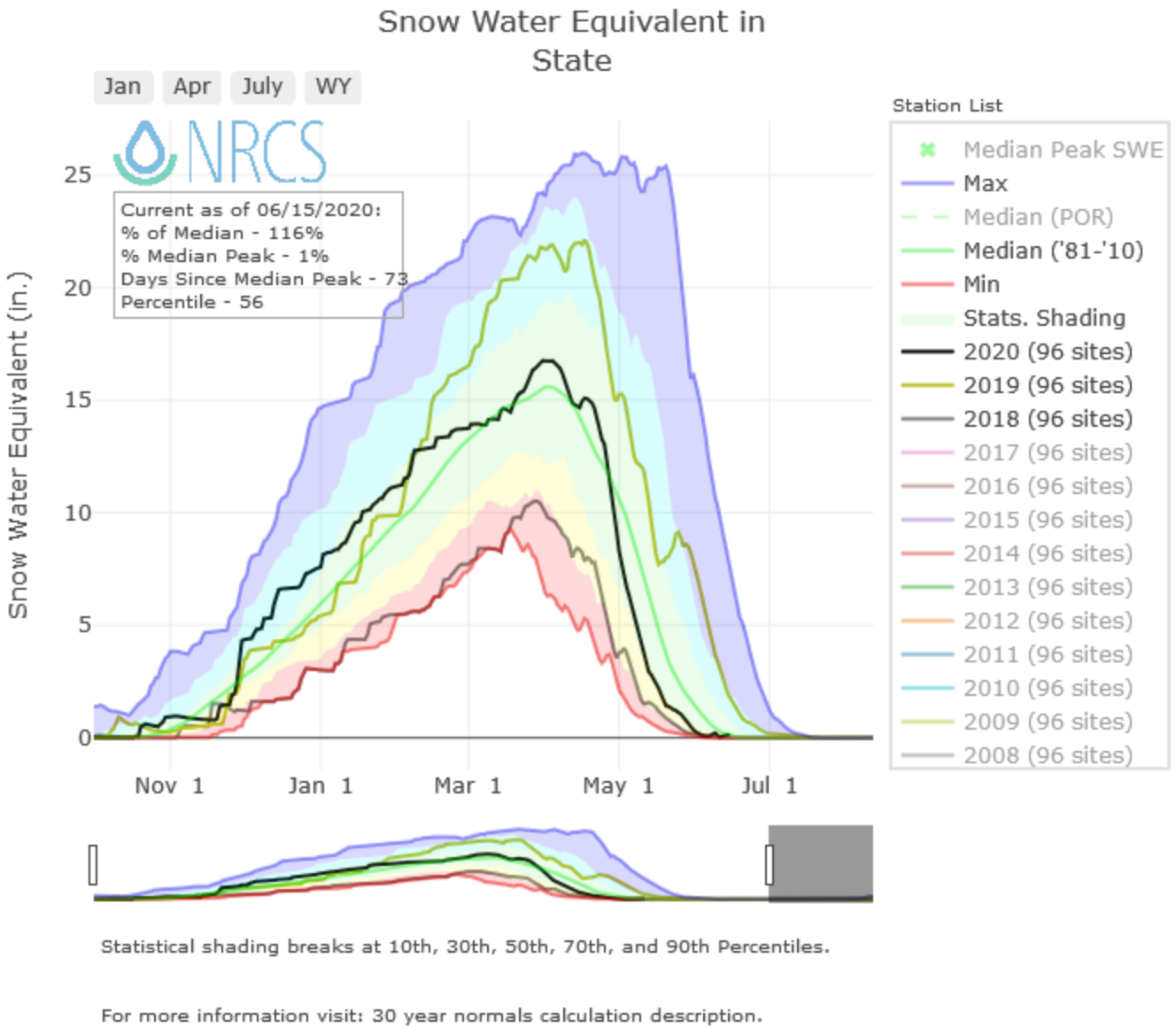


Soil Climate Analysis Network

SCAN sensors

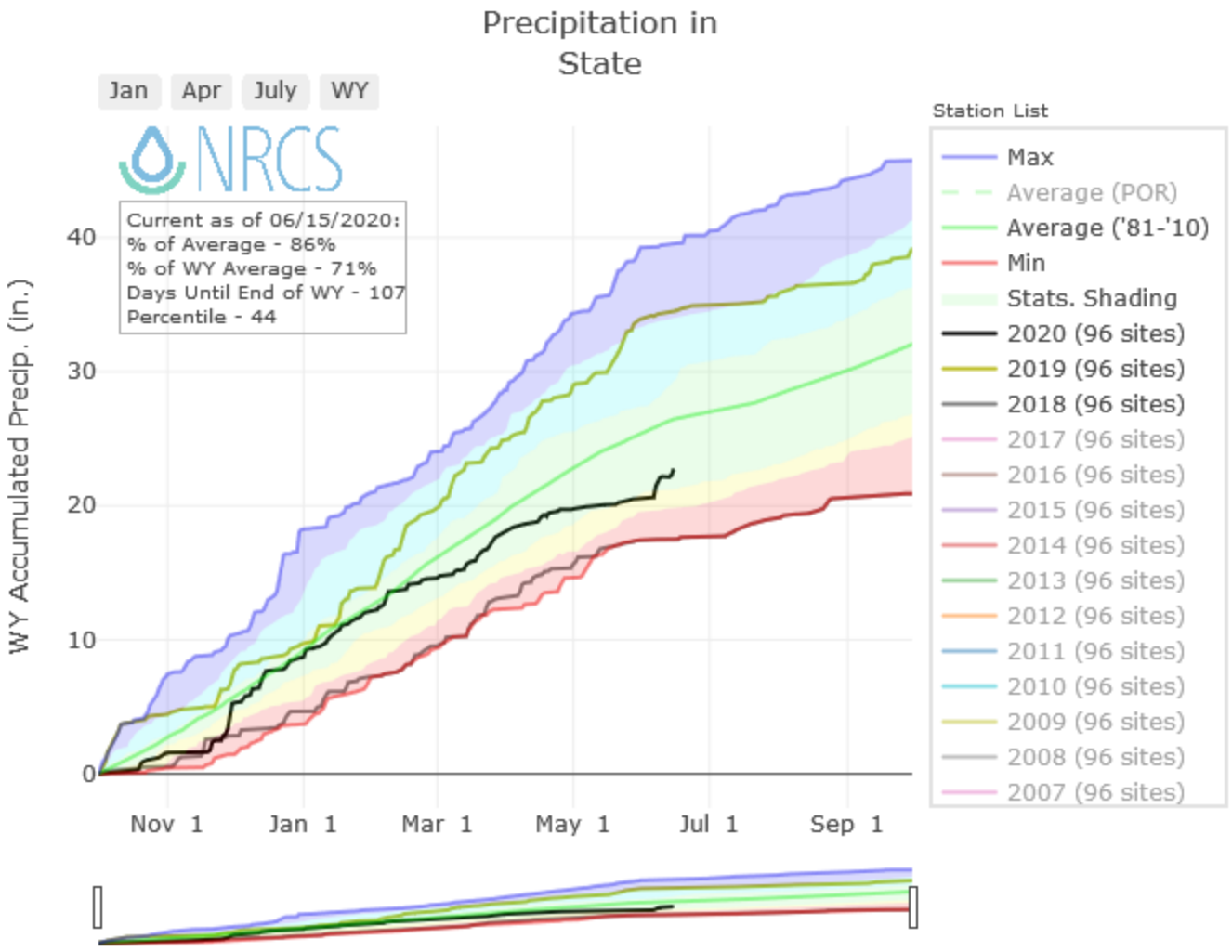
- Air temperature
- Relative humidity
- Wind speed & direction
- Rainfall
- Solar radiation
- Soil moisture & temperature

Current conditions



Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th Percentiles.

For more information visit: 30 year normals calculation description.



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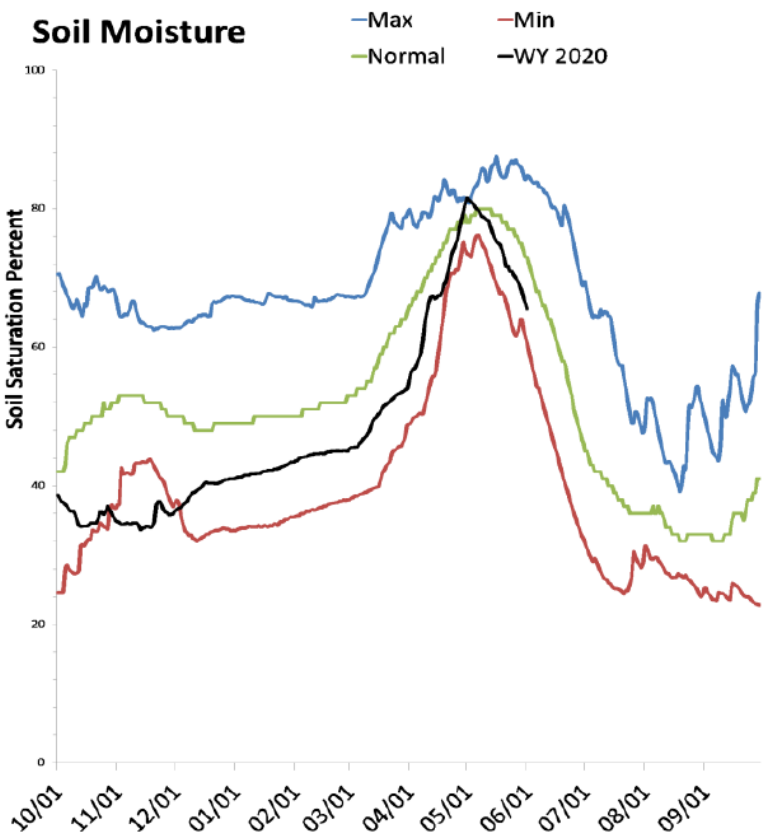
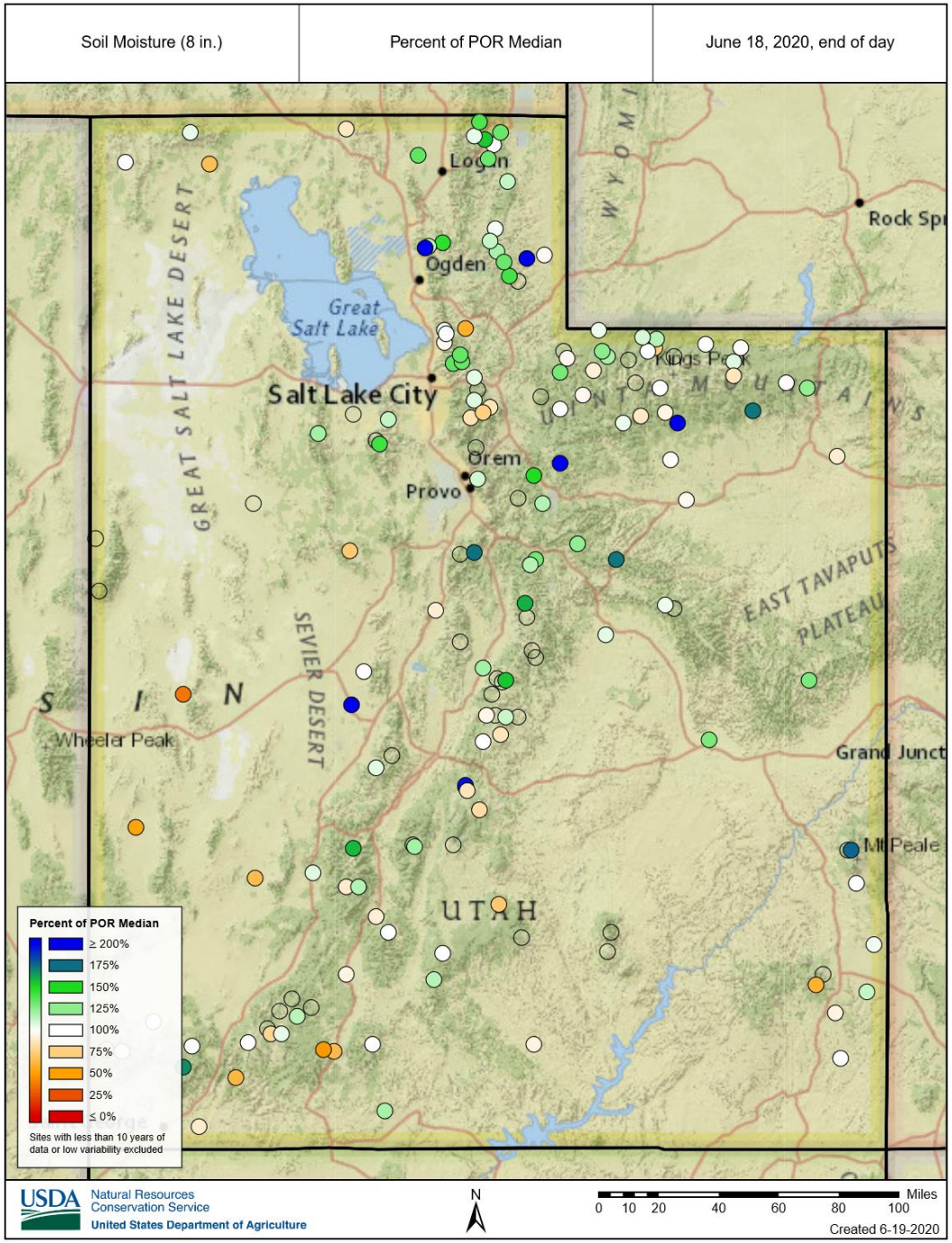


- > 100% for northern UT mtns
- < 100% for southern UT mtns & valley locations
- ~ 100% for central UT

- (+ lots of outliers due to local topography)



June 1, 2020

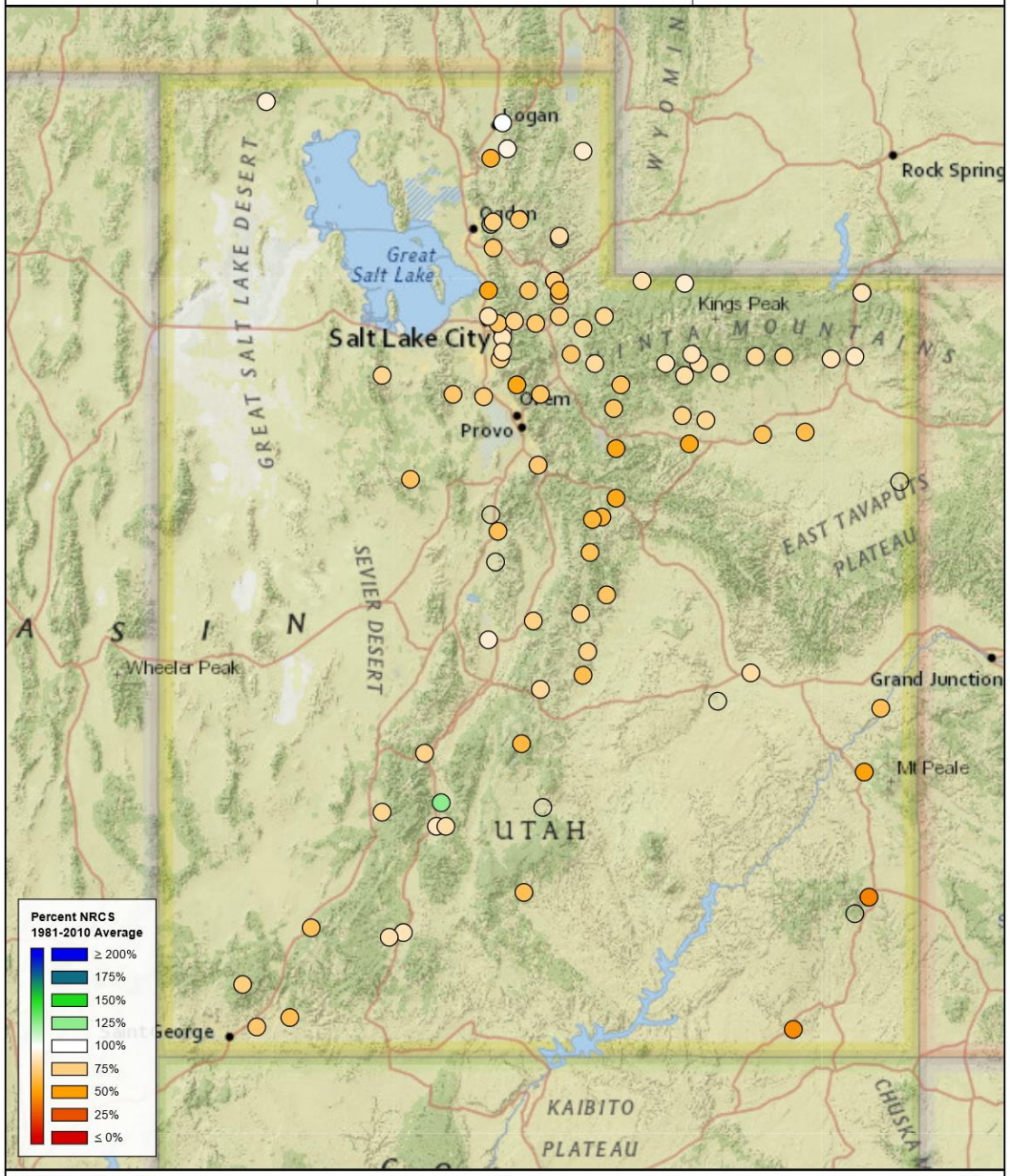
Water Availability Index

Basin or Region	May EOM* Storage	May Flow	Storage + Flow	Percentile	WAI#	Years with similiar WAI
	*KAF^*	*KAF^*	*KAF^*	*%*		
Bear River	1122	46.9	1169	85	3.0	97, 99, 98, 83
Woodruff Narrows	46.8	46.9	93.7	61	0.9	08, 14, 16, 07
Little Bear	14.6	8.2	22.8	38	-1.0	94, 14, 02, 18
Ogden	108.0	15.8	123.8	37	-1.1	04, 91, 18, 89
Weber	200.1	61.4	261.6	65	1.2	07, 95, 99, 08
Provo River	455.5	48.8	504.3	88	3.2	18, 17, 06, 09
Western Uinta	220.2	22.8	243.0	88	3.2	93, 00, 09, 01
Eastern Uinta	39.2	25.2	64.4	20	-2.5	90, 13, 81, 15
Blacks Fork	28.1	40.4	68.6	87	3.1	09, 17, 87, 14
Price	58.9	9.7	68.6	63	1.1	88, 87, 09, 11
Smiths Creek	14.3	14.2	28.5	95	3.7	17, 87, 01, 14
Joes Valley	55.8	20.4	76.2	66	1.3	14, 07, 99, 87
Moab	1.7	0.8	2.5	26	-2.0	10, 15, 04, 14
Upper Sevier River	110.4	12.1	122.6	68	1.5	87, 86, 99, 88
San Pitch	6.7	6.2	12.8	32	-1.5	92, 05, 03, 89
Lower Sevier	104.2	3.8	108.0	24	-2.1	02, 15, 14, 09
Beaver	17.5	7.9	25.4	56	0.5	12, 96, 87, 99
Virgin River	40.4	16.0	56.4	50	0.0	16, 08, 09, 99

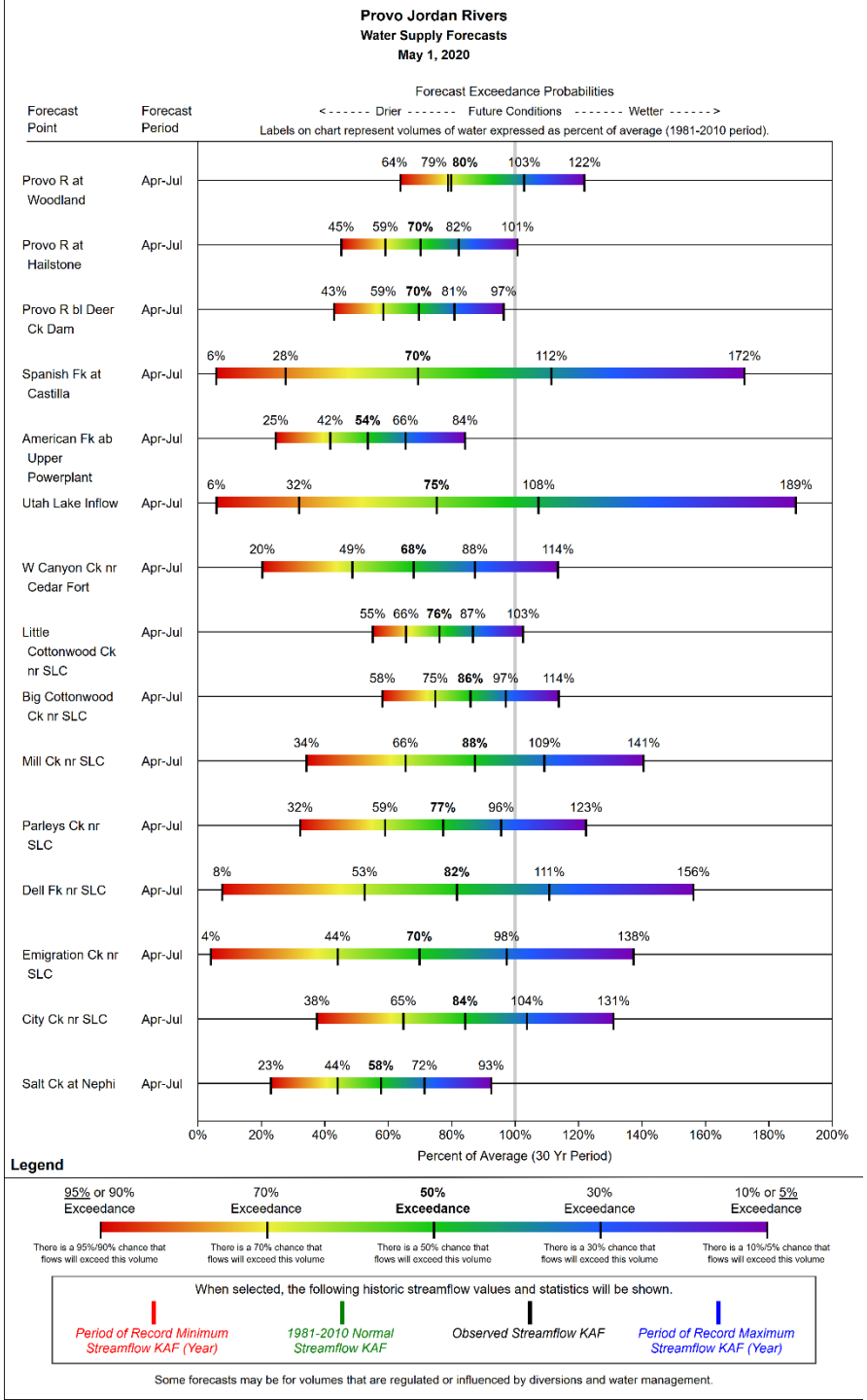
**EOM, end of month; # WAI, water availibilty index; ^KAF, thousand acre-feet.*

- WAI values combine current streamflow and reservoir conditions.
- Percentiles are compared to 30 year average WAI values.

Forecast Volume, 50% Exceedance Probability	Percent NRCS 1981-2010 Average	Primary Period, May 1, 2020



These graphs are available for all Utah basins on our webpage.



May 1, 2020

Surface Water Supply Index

Basin or Region	Apr EOM* Storage	MAY-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	*KAF^*	*KAF^*	*KAF^*	*%*		
Bear River	**957.4**	**105.0**	**1062.4**	**66**	**1.32**	**00, 87, 19, 12**
Woodruff Narrows	**58.3**	**87.0**	**145.3**	**49**	**-0.1**	**87, 81, 08, 10**
Little Bear	**14.2**	**19.0**	**33.2**	**48**	**-0.14**	**18, 16, 10, 08**
Ogden River	**98.0**	**57.0**	**155.0**	**56**	**0.51**	**10, 89, 16, 85**
Weber River	**385.8**	**170.0**	**555.8**	**54**	**0.3**	**08, 81, 10, 96**
Provo River	**1269.6**	**72.0**	**1341.6**	**70**	**1.7**	**12, 10, 09, 96**
Western Uinta	**190.7**	**87.0**	**277.7**	**76**	**2.13**	**98, 87, 19, 97**
Eastern Uinta	**32.6**	**56.1**	**88.7**	**29**	**-1.73**	**03, 81, 15, 92**
Blacks Fork	**15.7**	**75.0**	**90.7**	**42**	**-0.66**	**91, 18, 06, 15**
Smiths Fork	**6.6**	**25.0**	**31.6**	**55**	**0.44**	**97, 91, 01, 14**
Price River	**53.6**	**21.0**	**74.6**	**71**	**1.73**	**87, 17, 97, 99**
Joe's Valley	**47.8**	**40.0**	**87.8**	**56**	**0.51**	**10, 93, 09, 08**
Ferron Creek	**7.2**	**27.0**	**34.2**	**37**	**-1.12**	**00, 07, 15, 04**
Moab	**1.7**	**1.9**	**3.7**	**32**	**-1.47**	**14, 00, 03, 10**
Upper Sevier	**113.1**	**50.0**	**163.1**	**68**	**1.52**	**06, 87, 84, 88**
San Pitch	**9.6**	**11.8**	**21.4**	**32**	**-1.52**	**13, 17, 01, 89**
Lower Sevier	**128.3**	**74.0**	**202.3**	**46**	**-0.3**	**13, 93, 19, 96**
Beaver River	**21.8**	**18.0**	**39.8**	**59**	**0.71**	**96, 06, 81, 87**
Virgin River	**40.9**	**28.0**	**68.9**	**52**	**0.14**	**08, 09, 97, 00**

**EOM, end of month; # SWSI, surface water supply index; ^KAF, thousand acre-feet.*

- SWSI values combine forecasted streamflow and reservoir conditions.
- Percentiles are compared to 30 year average SWSI values.

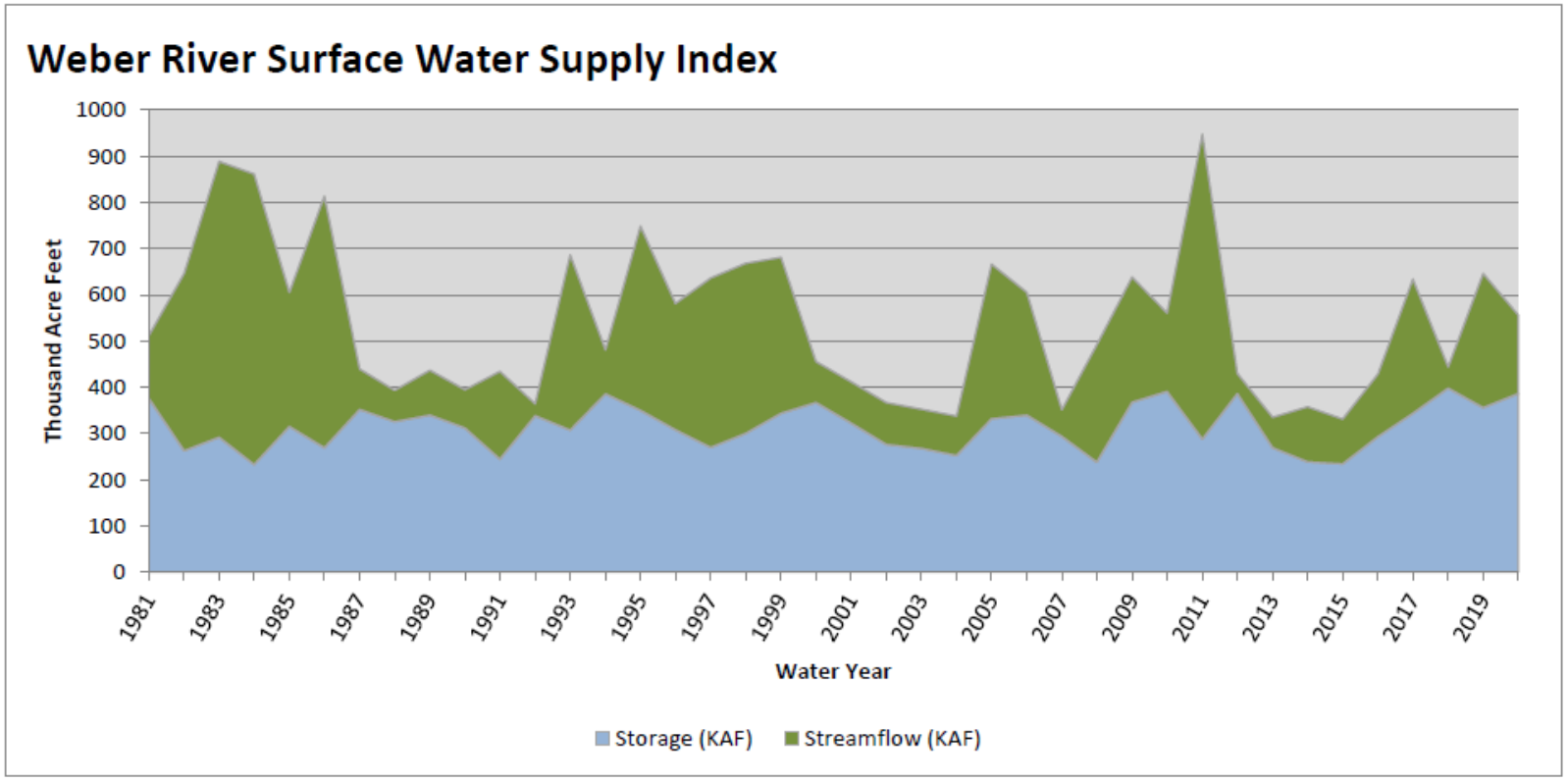
Example: SWSI for Weber River

May 1, 2020

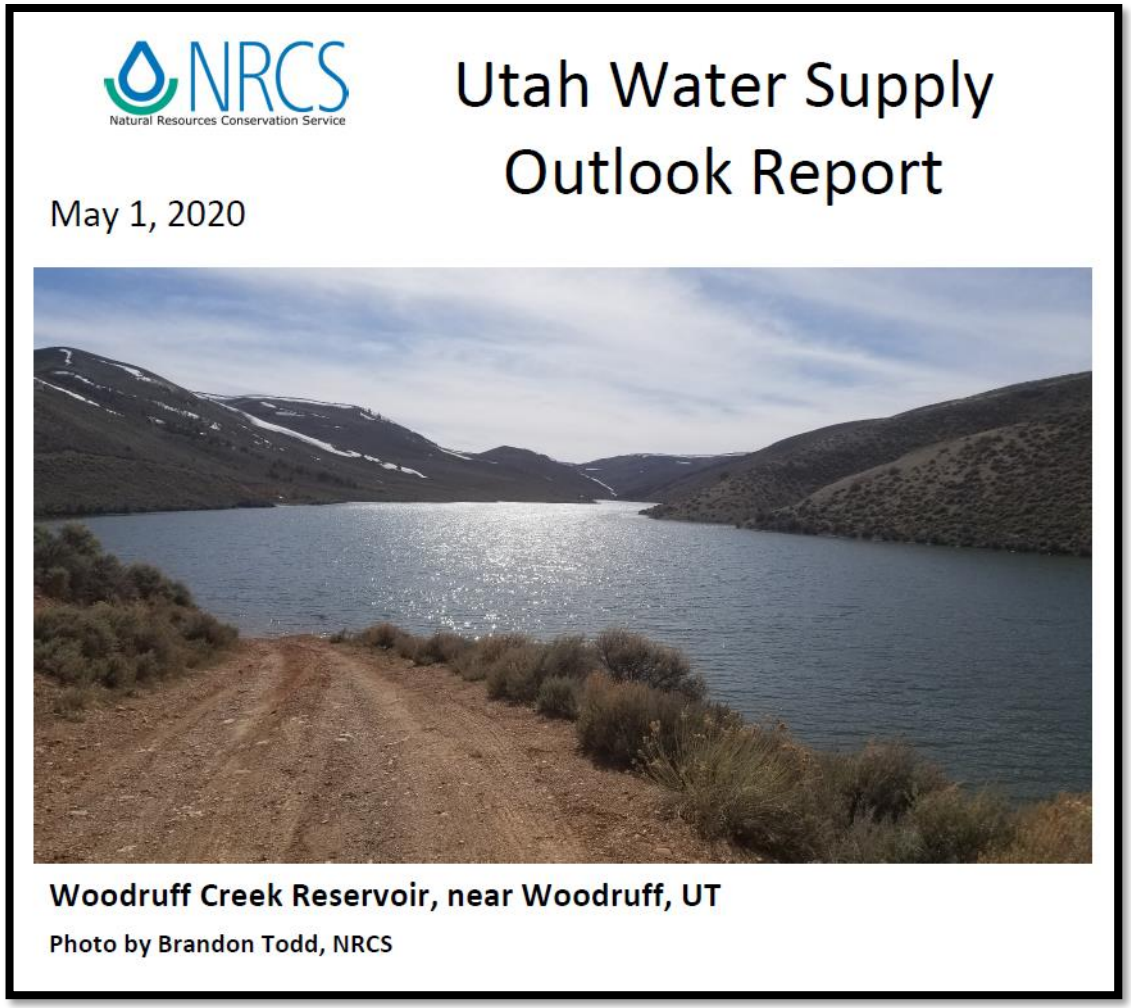
Surface Water Supply Index

Basin or Region	Apr EOM* Storage	MAY-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Weber River	**385.84**	**170.00**	**555.84**	**54**	**0.3**	**08, 81, 10, 96**

*EOM, end of month; #SWSI, Surface Water Supply Index; ^KAF, thousand acre-feet.



- Conditions & forecasts summarized in NRCS Snow Survey's:
  - May 1st *Water Supply Update Report*
  - June 1st *Climate & Water Report*



Other updates…

- New SNOTEL sites:
  - submitted permit for Wolf Creek Pass
  - to submit: upper Lasal Mtn (likely FY21)

- Staffing
  - hired 2 full time staff + 1 intern this year
  - plan to be fully staffed by FY21

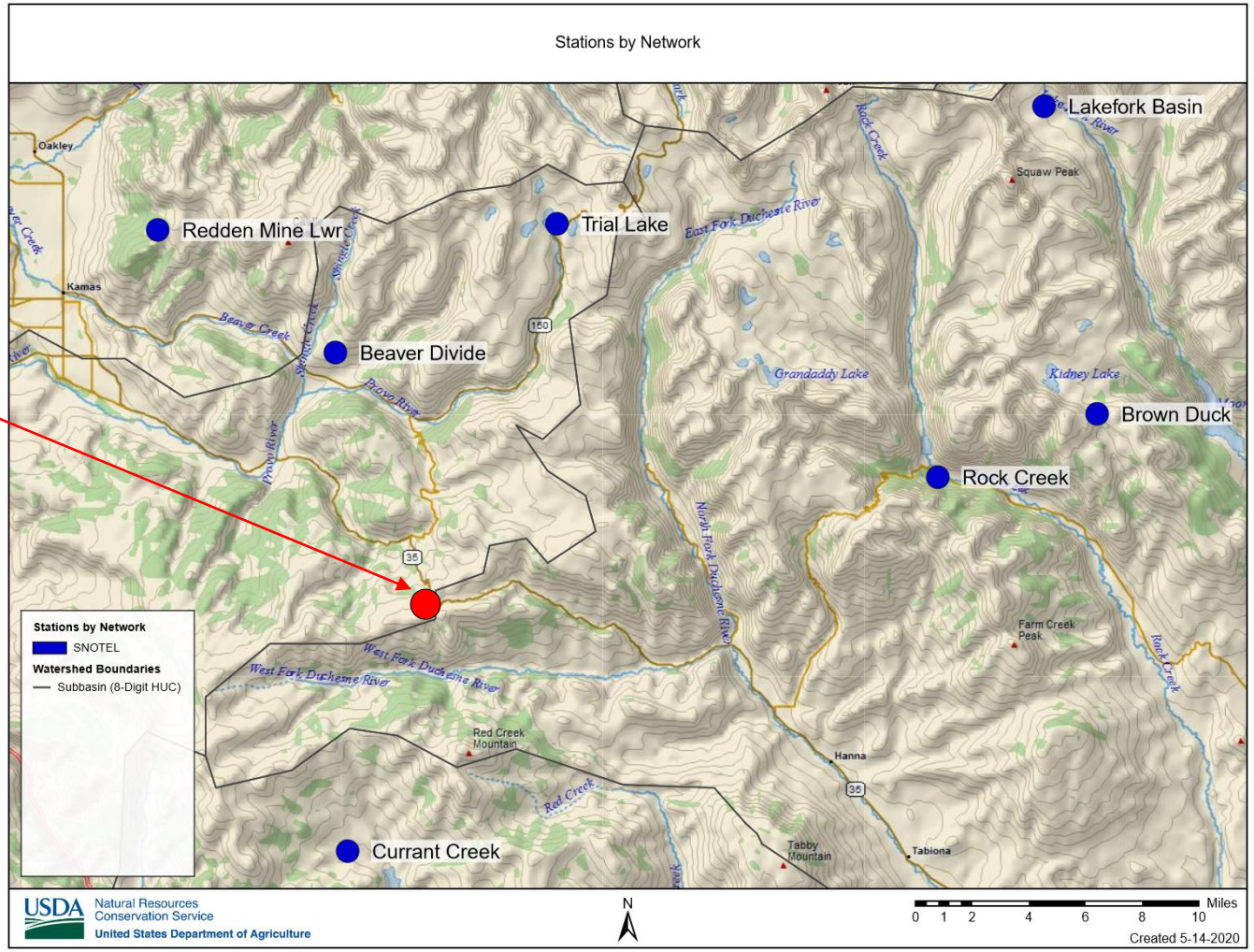
- Upgrading aging infrastructure at SNOTEL sites
  - up-to-date power systems
  - replacing outdated shelters, power systems, & instruments

Permitting submitted for new SNOTEL site at Wolf Creek Pass

Recon this winter, SWE measurements

Feb. 28th
Wolf Creek Pass: 23.5”
(Trial Lake: 19.0”)

April 29th
Wolf Creek Pass: 26.8”
(Trial Lake: 23.9”)



- headwaters of Duchesne and Provo Rivers
- anticipate site installation this summer…


THANK YOU!!!